

MODEL MATEMATIK EKSTRAKSI AROMATIK BAHAN BAKAR KEROSEIN MENGGUNAKAN SOLVEN DMSO DALAM KOLOM BERISI

Ramli Sitanggang
Th.1999

ABSTRAK

Aliphatic solution from fuel is used for metal organic solvent and a medium of uranium extraction that required separation process of aromatic compound contained within it. Aromatic separation is conducted by countercurrent extraction. Extraction equipment is a column with rasching ring glass having 0.5 cm of diameter. The flow on solvent dimethylsulfoxid extraction is a continuous flow, while fuel that contain of aromatic is a dispersion one. Mathematical extraction model represented the transfer of aromatic mass by considering the mixture system of dimethylsulfoxid-xylen-kerosene and extraction in the column which is occurred in the steady state. In steady condition, aromatic mass transfer from dispersion flow into continuous flow is influenced by the difference of concentration, convection and axial mixing with mathematical model as follows:

$$\frac{d^2 C_x}{dz_r^2} - Pe_c \frac{dC_x}{dz_r} + \varepsilon Sh_c \left[\left(\frac{U_c}{K U_d} - 1 \right) C_x + \frac{1}{K} C_{y0} \right] = 0$$

$$C_{y0} = C_{y1} - \left(\frac{L_c}{L_d} (C_{x0} - C_{x1}) \right)$$

Sherwood and Peclet ammount at the scope of observation of Re_c variable around 8 to 14. U_c/U_d around 1.22 to 1.88 and Z/dp around 0 to 160 as follows:

$$Sh_c = 0,686 (Re_c)^{0,446} \left[\frac{U_c}{U_d} \right]^{0,380} \left[\frac{Z}{dp} \right]^{0,057}$$

$$Pe_c = 314,1 (Re_c)^{-0,409} \left[\frac{U_c}{U_d} \right]^{-0,979} \left[\frac{Z}{dp} \right]^{0,413}$$

The mathematical model of extraction above can be used to arrange extraction equipment and find the aromatic distribution within the extraction equipment.